

Washington Territory.—Walla Walla, 11th; Neah Bay, 16th, 17th, 30th; Pleasant Grove, 16th, 18th.

Wisconsin.—La Crosse, 4th; Milwaukee, 8th, 9th; Madison, 27th, 28th.

Wyoming.—Fort Bridger, 21st.

PRECIPITATION FROM A CLOUDLESS SKY.

Cincinnati, Ohio: fine snow fell from a cloudless sky from 10.21 to 10.42 p. m. of the 6th.

TEMPERATURE OF WATER.

The following table shows the highest and lowest temperatures of water observed at the several stations; the monthly ranges of water temperature; the average depth at which the observations were made; and the mean temperature of the air:

Temperature of water for December, 1885.

Station.	Temperature at bottom.		Range.	Average depth, feet and tenths.	Mean temperature of the air at station.
	Max.	Min.			
Atlantic City, New Jersey	45.6	38.2	7.4	13.0	36.9
Alpena, Michigan*	34.0	30.5	3.5	12.7	24.3
Augusta, Georgia	52.5	42.9	9.6	10.1	45.0
Baltimore, Maryland	45.3	36.3	9.0	9.6	37.6
Block Island, Rhode Island	46.4	35.5	10.9	8.6	30.7
Boston, Massachusetts*	39.4	31.8	7.6	20.7	32.8
Buffalo, New York	37.0	31.0	6.0	11.5	30.0
Canby, Fort, Washington Territory	50.8	44.6	15.8	28.8	46.7
Cedar Keys, Florida	60.0	47.8	12.2	7.8	52.8
Charleston, South Carolina	54.8	47.1	7.7	39.6	50.4
Chicago, Illinois†	34.1	32.3	1.8	8.3	31.1
Chincoteague, Virginia	45.6	33.0	12.6	3.3	40.4
Cleveland, Ohio*	38.8	32.2	6.6	14.0	31.5
Detroit, Michigan*	38.4	34.6	3.8	24.8	32.9
Duluth, Minnesota	38.8	34.1	4.7	10.2	19.2
Eastport, Maine	46.0	39.4	6.6	16.5	27.8
Escanaba, Michigan*	38.6	33.7	4.9	17.8	22.8
Galveston, Texas	62.0	47.3	14.7	12.6	57.6
Grand Haven, Michigan*	37.1	32.0	5.1	19.0	28.5
Indianola, Texas	63.8	48.5	15.3	7.9	58.5
Jacksonville, Florida	59.0	52.5	6.5	18.0	53.3
Key West, Florida	76.0	60.1	15.9	17.8	64.7
Mackinaw City, Michigan	39.4	32.0	7.4	10.0	27.1
Macon, Fort, North Carolina	57.0	43.5	13.5	12.2	47.0
Marquette, Michigan*	38.5	32.4	6.1	12.7	23.4
Milwaukee, Wisconsin*	39.4	34.6	4.8	8.0	26.3
Mobile, Alabama	55.0	46.6	8.4	15.8	49.5
New Haven, Connecticut	40.0	30.7	9.3	15.2	33.8
New London, Connecticut					
New York City	44.0	33.5	10.5	17.3	36.0
Norfolk, Virginia	46.7	40.9	5.8	16.6	43.2
Pensacola, Florida	62.6	49.4	13.2	17.2	50.5
Portland, Maine	40.9	36.7	4.2	17.4	27.2
Portland, Oregon	48.7	41.6	7.1	51.4	43.0
Sandusky, Ohio	37.0	33.2	3.8	11.0	31.6
Sandy Hook, New Jersey	45.3	38.8	6.5	2.1	37.0
San Francisco, California	56.7	54.0	2.7	38.5	53.5
Savannah, Georgia	52.1	42.7	9.4	10.3	51.1
Smithville, North Carolina	54.9	46.5	8.4	10.7	46.5
Toledo, Ohio*	36.1	32.3	3.8	12.8	30.2
Wilmington, North Carolina					

* Observations interrupted by ice; see text.

† Instrument broken from 1st to 23d.

Observations were interrupted by ice during the month, as follows: Alpena, Michigan, from 6th to 21st; Boston, Massachusetts, from 7th to 31st; Cleveland, Ohio, on 3d, 5th, 7th, 8th, from 12th to 17th, on 19th and 20th; Detroit, Michigan, from 8th to 29th; Escanaba, Michigan, from 8th to 31st; Grand Haven, Michigan, on 7th and 8th. Marquette, Michigan, on 7th, 8th, and from 14th to 17th; Milwaukee, Wisconsin, from 6th to 31st; Toledo, Ohio, from 7th to 23d, and from 26th to 31st.

WINDS.

The most frequent directions of the wind during December, 1885, are shown on chart ii by the arrows flying with the wind; they are also given in the tables of miscellaneous data. In the Lake region, Ohio Valley, and Tennessee, and in the districts on the Atlantic coast, the prevailing winds were generally from northwest to southwest; in the Missouri Valley they were northwesterly; in the Gulf States, Rocky Mountain regions, and on the Pacific coast they were variable.

HIGH WINDS.

[In miles per hour.]

Wind-velocities of fifty or more miles per hour were reported during the month, as follows:

Mount Washington, New Hampshire, 80, nw., 3d; 74, nw., 4th; 76, nw., 5th; 90, w., 6th; 79, w., 7th; 76, nw., 8th; 96, sw., 9th; 84, w., 10th; 93, nw., 11th; 80, nw., 12th; 92, se., 13th; 80, nw., 14th; 90, nw., 15th; 50, sw., 18th; 88, nw., 20th; 70, nw., 21st; 65, w., 22d; 85, nw., 23d; 80, n., 24th; 56, n., 25th; 74, ne., 26th; 68, ne., 27th; 73, nw., 28th; 96, nw., 29th; 50, nw., 30th; 61, se., 31st.

Pike's Peak, Colorado, 88, nw., 3d; 69, nw., 4th; 56, nw., 5th; 78, nw., 6th; 76, w., 7th; 54, nw., 11th; 52, nw., 12th; 64, sw., 15th; 84, w., 16th; 76, nw., 17th; 90, w., 22d; 56, sw., 25th; 60, sw., 26th; 60, w., 27th.

New York City, 50, w., 8th.

Grand Haven, Michigan, 50, nw., 18th.

Barnegat City, New Jersey, 52, nw., 7th; 52, ne., 26th.

Sandy Hook, New Jersey, 55, nw., 5th; 54, nw., 7th; 51, n., 26th; 52, n., 27th.

Fort Buford, Dakota, 60, w., 3d; 55, w., 4th.

Poplar River, Montana, 56, nw., 3d.

Fort Shaw, Montana, 56, w., 3d.

Fort Benton, Montana, 57, sw., 3d.

Kitty Hawk, North Carolina, 56, n., 25th; 65, ne., 26th.

Fort Macon, North Carolina, 52, sw., 5th; 52, n., 26th.

Palestine, Texas, 52, nw., 4th.

Cape Henry, Virginia, 50, n., 15th; 53, n., 26th.

Chincoteague, Virginia, 54, n., 26th.

Omaha, Nebraska, 50, nw., 4th.

Cheyenne, Wyoming, 52, nw., 22d.

Block Island, Rhode Island, 60, ne., 26th.

Saint Louis, Missouri, 60, nw., 4th.

Moorhead, Minnesota, 50, s., 26th.

Sandusky, Ohio, 56, nw., 5th.

Fort Sill, Indian Territory, 53, n., 4th.

Fort Elliott, Texas, 64, nw., 4th.

Tatoosh Island, Washington Territory, 51, w., 30th.

Cape Mendocino, California, 62, se., 15th; 76, se., 20th; 84, se., 21st; 84, se., 22d; 100, se., 23d; 104, se., 24th; 84, se., 25th.

LOCAL STORMS AND TORNADOES.

Little Rock, Arkansas: a tornado, of limited extent, occurred two and a half miles west of this place on the afternoon of the 8th, moving from southwest towards the northeast, causing but slight damage.

The following is from the "La Crosse (Wisconsin) Daily Republican," of December 17, 1885:

PANAMA, December 17.—Colon has been visited by a severe cyclone, which has done considerable damage. It commenced on the 2d instant, about 2 p. m., and the next day lulled, but commenced again with terrible severity. All the steamers in port put out to sea for safety, returned, and had to put out again. The damage to property has been very heavy, and the loss of life most serious. The following vessels were sunk with their crews: "Holden," "Karnan," "Blanche," "Oataton," "Atwood," "Ariel," "Veteran," "Ocean," "Lynton," "Avelina," "Stella," "Catatina," "Figri," "Douglas," and two others whose names could not be ascertained.

The rain poured down in torrents, and a terrible gale of wind set in from the northeast. The "Royal Mail's" new freight office was destroyed by the storm. Wharf number four, belonging to the Panama railroad, was almost demolished, the rails having been torn up and the earthworks destroyed by the force of the tornado.

NAVIGATION.

STAGE OF WATER IN RIVERS.

The Mississippi River froze at Saint Paul, Minnesota, on the 6th and at La Crosse, Wisconsin, on the 7th; at Dubuque, Iowa, it was frozen from the 8th to 31st; Davenport, Iowa, 8th to 26th, and Keokuk, Iowa, 13th to 22d. At Saint Louis, Missouri, the river fell to 2.1 feet on the 16th and 17th, being the lowest stage of water at that place in the record of the Signal Service.

The Missouri River froze at Fort Buford and Yankton, Dakota, on the 9th; Bismarck and Fort Yates, Dakota, on the 6th, and at Fort Sully, Dakota on the 8th; at Omaha, Nebraska, it was frozen from the 10th to 28th, and at Leavenworth, Kansas, from the 12th to 15th, and 17th to 21st.

In the following table are shown the danger-points at the

various river stations; the highest and lowest stages for December, 1885, with the dates of occurrence, and the monthly ranges:

Heights of rivers above low-water mark, December, 1885.

[Expressed in feet and tenths.]

Stations.	River-gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River:</i>						
Shreveport, Louisiana.....	29.9	20, 21	5.7	8	1.7	4.0
<i>Arkansas River:</i>						
Fort Smith, Arkansas.....	22.0	30	5.0	19 to 22	2.1	2.9
Little Rock, Arkansas.....	23.0	31	3.5	26 to 29	2.7	0.8
<i>Missouri River:</i>						
Yankton, Dakota *.....	24.0	1 to 4	10.7	5 to 8	10.6	0.1
Omaha, Nebraska *.....	18.0	29	5.9	9, 28	5.3	0.6
Leavenworth, Kansas *.....	20.0	28	7.3	24	4.8	2.5
<i>Mississippi River:</i>						
Saint Paul, Minnesota *.....	14.5	2 to 5	2.1	1	2.0	0.1
La Crosse, Wisconsin.....	24.0	24, 25, 26	5.4	6	3.0	2.4
Dubuque, Iowa *.....	16.0	1, 2	3.5	8	2.1	1.4
Davenport, Iowa *.....	15.0	30, 31	7.0	6	2.5	4.5
Keokuk, Iowa *.....	14.0	23	6.5	11	0.0	6.5
Saint Louis, Missouri.....	32.0	1	9.2	16, 17	2.1	7.1
Cairo, Illinois.....	40.0	22	24.8	8, 9	14.6	10.2
Memphis, Tennessee.....	34.0	24, 25	17.0	3	9.2	7.8
Vicksburg, Mississippi.....	41.0	29, 30	20.0	12, 14, 15	10.9	9.1
New Orleans, Louisiana.....	13.0	31	5.8	7, 15, 16, 17, 19, 20	3.0	2.8
<i>Ohio River:</i>						
Pittsburg, Pennsylvania.....	22.0	11	12.1	8, 9	3.0	9.1
Cincinnati, Ohio.....	50.0	17	30.2	12	12.5	17.7
Louisville, Kentucky.....	25.0	18	11.4	7, 8	6.7	4.7
<i>Cumberland River:</i>						
Nashville, Tennessee.....	40.0	24, 25	17.0	3	9.2	7.8
<i>Tennessee River:</i>						
Knoxville, Tennessee †.....		17	5.6	30	1.8	3.8
Chattanooga, Tennessee.....	33.0	16	21.4	2	4.6	10.8
<i>Monongahela River:</i>						
Pittsburg, Pennsylvania.....	29.0	11	12.1	8, 9	3.0	9.1
<i>Savannah River:</i>						
Augusta, Georgia.....	32.0	15	18.6	8	7.7	10.9
<i>Mobile River:</i>						
Mobile, Alabama.....		8, 13	16.8	5	14.8	2.0
<i>Sacramento River:</i>						
Red Bluff, California.....		26	21.1	15, 16	2.4	18.7
Sacramento, California.....		30, 31	23.9	20	17.2	6.7
<i>Willamette River:</i>						
Portland, Oregon.....		19	9.7	4, 5	3.2	6.5
<i>Colorado River:</i>						
Yuma, Arizona.....		1	16.0	30, 31	14.6	1.4

* Observations interrupted by ice; see text. † Observations commenced December 17th.

NOTE.—The zero of river-gauge at New Orleans was changed on November 1, 1885, from high-water of 1874 to low-water of 1876. This change makes the readings 16.2 feet lower than those made previous to November 1, 1885.

ICE IN RIVERS AND HARBORS.

New Haven Harbor.—New Haven, Connecticut: harbor frozen over on the 8th.

Hudson River.—Menand Station (near Albany), New York: navigation closed on the 8th; on 10th ice passed out of river, which remained open until 28th.

Albany, New York: floating ice, 10th to 26th; river frozen over on the 7th, 8th, 9th, 27th to 31st. Navigation on the canal closed on the 1st.

Rondout, Ulster county: on the 29th the river was closed between Albany and Castleton.

New York City: floating ice observed in river on 28th, 29th, 30th.

Potomac River.—Fort Myer, Virginia: river froze over on the 8th.

Oswego River.—Oswego, New York: the schooner "Herbert Dudley" left for Kingston, Ontario, on the 18th, being the last departure of the season.

Niagara River.—Buffalo, New York: floating ice in the river on the 6th.

Lake Erie.—Buffalo, New York: the steamer "Nassau" left for Cleveland on the 13th, being the last departure of the season; the steamer "Oceanic," of the Lehigh Valley Transportation Company, arrived on the 25th from Chicago, being the first instance in many years of so late an arrival; the captain reported but little ice on Lake Erie.

Presque Isle Bay.—Erie, Pennsylvania: the bay was frozen over on the 7th.

Cuyahoga River.—Cleveland, Ohio: river froze on the 7th.

Sandusky Bay.—Sandusky, Ohio: ice formed in the bay on

the 6th; bay frozen and navigation closed for the season on the 7th.

Maumee River.—Toledo, Ohio: floating ice on the 6th; the river froze over on the 7th.

Detroit River.—Detroit, Michigan: floating ice in the river from the 7th to 11th and from the 14th to 29th.

Black River.—Port Huron, Michigan: Black River frozen over on the 7th; the steam-barge "Chauncey Hurlbert" left for Detroit on the 13th, being the last departure of the season.

Grand River.—Grand Haven, Michigan: river frozen on the 7th; clear of ice on the 9th.

Thunder Bay and Thunder Bay River.—Alpena, Michigan: river frozen from 6th to 21st; bay partly frozen, 7th, 8th, 18th; river clear of ice, 22d; floating ice in the river and bay, 23d to 30th.

Strait of Mackinac.—Mackinaw City, Michigan: the steam barges "H. E. Packer" and "Fred Mercur," of the Lehigh Valley line, from Buffalo to Chicago, passed through the strait on the 25th. This is the first time in twenty years that a vessel has passed through the strait at so late a date.

Little Bay De Noquet.—Escanaba, Michigan: the propeller "F. H. Fairbank" left for Cleveland, Ohio, on the 1st, being the last departure of the season. Ice formed on the shore of the bay 1st to 21st, 23d to 27th, 29th, 31st.

Lake Michigan.—Chicago, Illinois: considerable ice in the river and harbor, 7th to 23d.

Manistique, Schoolcraft county, Michigan: the last boat of the season left on the 10th. Neither Manistique Harbor nor Lake Michigan was closed by ice during the month.

Milwaukee River.—Milwaukee, Wisconsin: river froze on the 6th.

Manitowoc River.—Manitowoc, Wisconsin: river frozen on the 5th.

Lake Superior.—Marquette, Michigan: ice in bay broke up on 9th; bay frozen on 12th; ice broke on 13th.

Duluth Bay.—Duluth, Minnesota: bay frozen from 3d to 31st.

Des Moines River.—Oskaloosa, Mahaska county, Iowa: river closed on the 6th.

Ohio River.—Pittsburg, Pennsylvania: floating ice, 6th to 18th, 29th, 30th.

Portsmouth, Ohio: floating ice, 14th.

Cincinnati, Ohio: floating ice, 16th.

Cairo, Illinois: floating ice, 17th, 18th.

Mississippi River.—Saint Paul, Minnesota: floating ice observed in the river on 5th; ice-dam formed on 6th.

Red Wing, Minnesota: river froze on the 5th.

La Crosse, Wisconsin: the steamer "Percy Swain," the last boat of the season, arrived on the 1st and went into winter quarters; the first light floating ice in the river observed on 4th; heavy floating ice on 5th, 6th; the ferry boat "Warsaw" made her last trip on 9th; ice stopped running and navigation closed 7th; teams crossed on the ice 10th; river partially clear of ice, along the Wisconsin shore, from 23d to 31st.

Dubuque, Iowa: floating ice, 5th, 6th; river frozen 8th, 31st.

Davenport, Iowa: floating ice, 5th, 6th, 22d, 24th, 25th, 28th to 31st; river frozen, 8th, 26th.

Keokuk, Iowa: floating ice from 5th to 13th, 23d to 27th, 31st; the Warsaw packet "Patience," went into winter quarters on the 6th, closing navigation for the season; river frozen from the 13th to 22d.

Cairo, Illinois: floating ice from 14th to 19th; navigation suspended between this place and Saint Louis from the 7th to the 23d, owing to heavy floating ice.

Missouri River.—Fort Buford, Dakota: floating ice in the river from the 2d to 8th; river frozen on the 9th.

Bismarck, Dakota: river frozen on 6th.

Fort Yates, Dakota: floating ice, 4th, 5th; river frozen, 6th.

Fort Sully, Dakota: running ice in the river, 4th to 7th; river frozen on the 8th.

Yankton, Dakota: river frozen on the 9th.

Omaha, Nebraska: river frozen on the 10th; ice broke up on the 28th.

Leavenworth, Kansas: floating ice on the river, 6th to 11th, 22d to 24th, 27th, 28th; river frozen, 12th to 15th, 17th to 21st.

Miscellaneous.—Mr. Wm. G. Yetter, voluntary observer at Catawissa, Columbia county, Pennsylvania, reports that navigation on the north branch of the Pennsylvania canal was closed by ice on the 7th.

Mr. Geo. S. Truman, voluntary observer at Genoa, Nance county, Nebraska, reports that the unusually mild weather during the last half of December caused the ice to break up in the Loup and Platte Rivers; considerable damage was done to the bridges at Columbus, Platte county.

FLOODS.

California.—San Francisco: the heavy rainfall of the 21st caused considerable damage by flood; in some parts of the city the water was four feet deep; cellars in the business portion of the city were flooded, damaging the goods contained in them, and entailing a loss of several thousand dollars.

Delta, Shasta county: the railroad track was washed out at numerous places between Tunnel No. 5 and Delta on the 25th; the Sacramento River, and all streams, are unusually high.

Yreka, Siskiyou county: the streams overflowed in consequence of the heavy rains of the 24th and 25th.

Redding, Shasta county: the Sacramento River rose eighteen feet on the 24th, and was higher than at any time since 1880. Considerable damage was done along the line of the railroad in this vicinity.

Marysville, Yuba county: the Yuba River reached a height of fourteen feet on the 25th, the highest point reached this season; the Feather River was also correspondingly high.

West Virginia.—Grantsville, Calhoun county: a sudden rise in the West Fork, a tributary of the Little Kanawha River, on the 29th, caused a great amount of damage; the Pennsylvania Lumber Company lost two saw-mills and \$10,000 worth of lumber.

HIGH TIDES.

Norfolk, Virginia: an unusually high tide occurred on the morning of the 2d, flooding the lower part of the city.

Indianola, Texas: a very high tide occurred on the 12th; the flats and lower part of the town were submerged.

Cohasset, Norfolk county, Massachusetts: an unusually high tide occurred on the 26th; much damage was done to property along the shore.

Nantasket, Norfolk county, Massachusetts: the water reached a higher point on the 26th than during the unusually high tides of November, 1885.

Sandwich, Barnstable county, Massachusetts: the highest tide ever known occurred on the 26th. Many streets were flooded to the depth of eight feet, doing much damage.

Very high tides occurred at Gloucester and Rockport, Essex county, Wellfleet, Barnstable county, Hingham, Plymouth county, Massachusetts, on the 26th, causing much damage along the coast.

Norfolk, Virginia: the highest tide since 1876 occurred on the 26th.

Cape Henry, Virginia: the highest tide in seven years occurred on the 26th.

Kitty Hawk, North Carolina: the tide of the 26th was the highest that has occurred in forty years; the sea-coast telegraph line was washed away in places, and much damage done to property in the vicinity of Oregon Inlet, North Carolina, where a dwelling house was carried off its foundation; a large number of cattle were also lost.

High tides were also reported, as follows:

Eastport, Maine, 24th to 27th.

Boston, Massachusetts, 26th.

New Haven, Connecticut, 14th.

Ocean City, Maryland, 26th.

Chincoteague, Virginia, 1st, 2d.

Fort Macon, North Carolina, 4th, 9th, 25th, 26th.

San Francisco, California, 21st.

LOW TIDES.

Chincoteague, Virginia, 20th, 21st.

Cedar Keys, Florida, 22d.

Indianola, Texas, 14th, 15th, 16th.

VERIFICATIONS.

INDICATIONS.

The detailed comparison of the tri-daily indications for districts east of the Rocky Mountains during December, 1885, with the telegraphic reports for the succeeding thirty-two hours, shows the general average percentage of verifications to be 81.73 per cent. The percentages for the four elements are: Weather, 85.84; direction of the wind, 79.25; temperature, 77.22; barometer, 87.94 per cent. By geographical districts, they are: For New England, 82.40; middle Atlantic states, 85.17; south Atlantic states, 84.50; eastern Gulf states, 83.78; western Gulf states, 80.14; lower lake region, 80.32; upper lake region, 80.76; Ohio Valley and Tennessee, 81.88; upper Mississippi valley, 82.07; Missouri Valley, 75.98. There were six omissions to predict, out of 3,221, or 0.19 per cent. Of the 3,215 predictions that have been made, one hundred and twenty-six, or 3.92 per cent., are considered to have entirely failed; one hundred and forty-nine, or 4.63 per cent., were one-fourth verified; four hundred and sixty-nine, or 14.59 per cent., were one-half verified; four hundred and sixty, or 14.31 per cent., were three-fourths verified; 2,011, or 62.55 per cent., were fully verified, so far as can be ascertained from the tri-daily reports.

The percentages of indications verified for the Pacific coast districts, are as follows: General average, 75.71. By elements they are: For weather, 81.82; wind, 70.91; temperature, 74.39. By districts they are: North Pacific coast region, 70.46; middle Pacific coast region, 77.42; south Pacific coast region, 79.24 per cent.

The general average percentage of verifications for all districts is 80.93 per cent.

The percentages of verifications of special predictions for certain localities are, as follows:

Baltimore, Maryland, 90.35; Washington City, 83.33; Erie, Pennsylvania, 66.94; Boston, Massachusetts, 75.81; New Haven, Connecticut, 77.42; Portland, Maine, 75.81; Albany, New York, 78.23; Pittsburg, Pennsylvania, 64.92; Cincinnati, Ohio, 71.77; Louisville, Kentucky, 70.16; Columbus, Ohio, 75.81; Cleveland, Ohio, 65.32; Indianapolis, Indiana, 77.50; Oswego, New York, 78.63; Rochester, New York, 79.44; Buffalo, New York, 77.02; Milwaukee, Wisconsin, 74.59; Chicago, Illinois, 80.74; Detroit, Michigan, 72.98; Toledo, Ohio, 74.19; Sandusky, Ohio, 75.00; Cairo, Illinois, 77.02; Saint Louis, Missouri, 81.50; Memphis, Tennessee, 75.81; Shreveport, Louisiana, 75.81; Iowa, 72.54; Tennessee, 84.68; Florida (thirteen days), 90.38; Omaha, Nebraska (twenty-seven days), 86.11; Arkansas (twenty-seven days), 84.43; Georgia (twenty-seven days), 90.28; New York City (thirty days), 78.33; Philadelphia, Pennsylvania (thirty days), 81.67; Colorado, 68.95.

CAUTIONARY SIGNALS.

During December, 1885, one hundred and fifty-seven cautionary signals were ordered. Of these, one hundred and forty-six, or 92.99 per cent., were justified by winds of twenty-five miles or more per hour, at or within one hundred miles of the station. Seventy-three cautionary off-shore signals were ordered, of which number, fifty-nine, or 80.82 per cent., were fully justified, both as to direction and velocity; seventy-one, or 97.25 per cent., were justified as to direction; and sixty, or 82.19 per cent., were justified as to velocity. Two northwest signals were ordered, both of which were justified as to direction and velocity. Two hundred and thirty-two signals of all kinds were ordered, two hundred and seven, or 89.22 per cent., being fully justified. These do not include signals ordered at display stations where the velocity of the wind is only estimated. Of the above cautionary off-shore signals, nineteen were changed from cautionary signals. Nine signals were